

A STUDY of ASTHMA

in

GENERAL PRACTICE

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INTRODUCTION

In general practice in an industrial area of Glasgow many patients are seen who are subject to periodic attacks of dyspnoea or bronchospasm. I do not refer to cases of obvious cardiac and renal asthma. The patients are of all ages. They may exhibit bronchial signs in the interval between the attacks or it may happen evidence of Bronchitis only occurs with the onset of bronchospasm. The great proportion of cases of asthma are met with in general practice. A general practitioner is able to keep his cases under observation over prolonged periods. The patients environment is not altered as it is in the hospital ward. For these reasons I consider the general practitioner is in some ways favoured for the study of asthma.

Such patients observed from time to time appeared to be in a continual state of ill health. The following observations and recollections first suggested that this unnatural state of health was associated with some toxæmia arising from disordered metabolism. Complexions invariably were sallow and muddy. Emergency treatment was successful in reducing the intensity of the spasm in many cases. The treatment was frequent sips of hot water and doses of Epsom salts and Bi-carbonate of soda. In two or three cases asthma occurred in the late months of pregnancy. One case was treated in hospital with no result and it was only when alkalies were given on advice from a general practitioner of wide experience that there was an improvement. This suggested that the Bronchospasm was associated with some toxæmia and the bronchospasm may only be a less common manifestation of toxæmia in pregnancy.

METHODS of INVESTIGATION

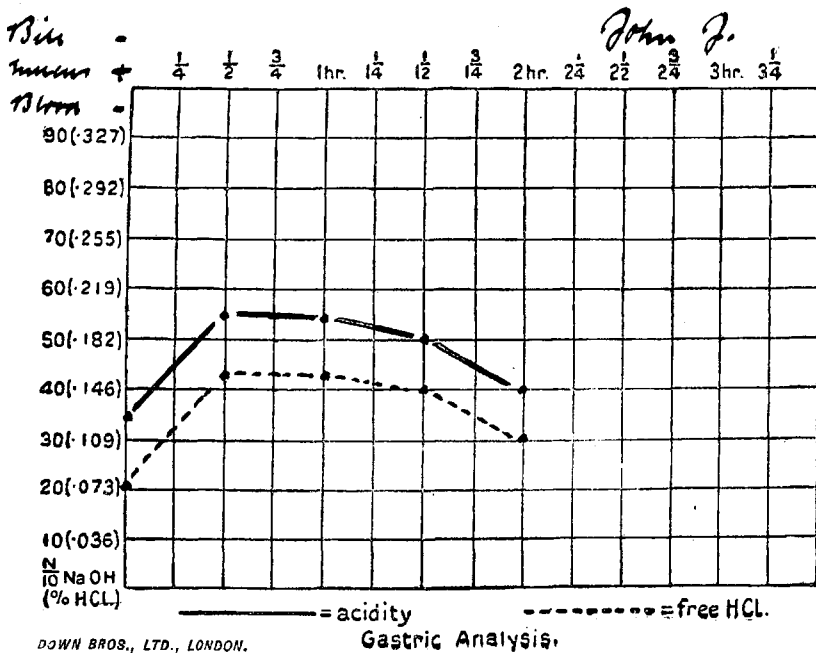
With the object of investigating the state of metabolism the following methods were adopted. The prevalence of gastric symptoms suggested that the toxaemia was due to faulty absorption of food. Before food is utilized by the body tissues it must first be prepared by digestion. A series of gastric analysis was therefore commenced. After leaving the stomach the chyme passes to the intestine where the process of digestion is continued. The estimation of urinary diastase was undertaken with the intention of finding out if faulty absorption of food due to pancreatic inefficiency was the cause of toxaemia. This theory however of the relation of diastase to pancreatic efficiency may be erroneous.

In performing this test certain precautions were taken. A 24 hour specimen of urine was collected and preserved by adding 1 c.c. of chloroform. The starch solution was freshly prepared on each occasion. Tubes were sterilized. A control was made with urine from a normal patient. In cases of high results the urine was boiled and the test repeated. In these cases also it was shown that the ferment was destroyed. The products of normal metabolism accumulate in the urine also the abnormal products which are signs of disordered metabolism. As a result of disordered metabolism urinary acidity may be increased. For these reasons the reaction of the urine to litmus was taken and the Ph. ascertained. Acetone as a valuable index of disordered metabolism was tested for in every case. As an indication of the amount of bacterial decomposition in the alimentary canal the presence of indican in the urine was tested for.

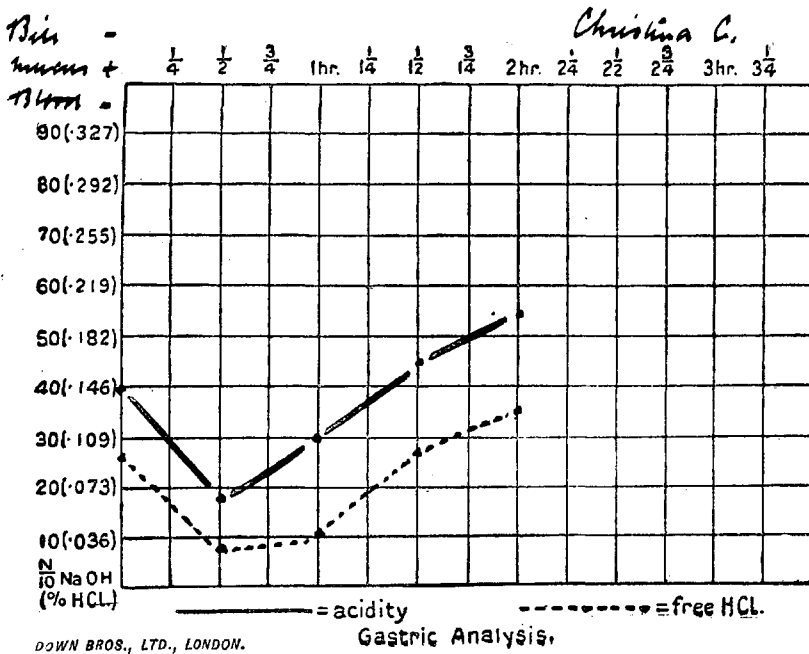
Indican may be increased by constipation therefore if constipation was a factor previous to an attack, it was noted. The specific gravity and nature of deposit were determined. The abnormal constituents, albumen and sugar were tested for. When an acidosis was suspected as in the pregnancy case, the alkali reserve of the blood was estimated. The blood urea was taken as a test for the investigation of renal function. The eosinophils were counted, the view being that they were concerned with protein poisons.

C A S E S

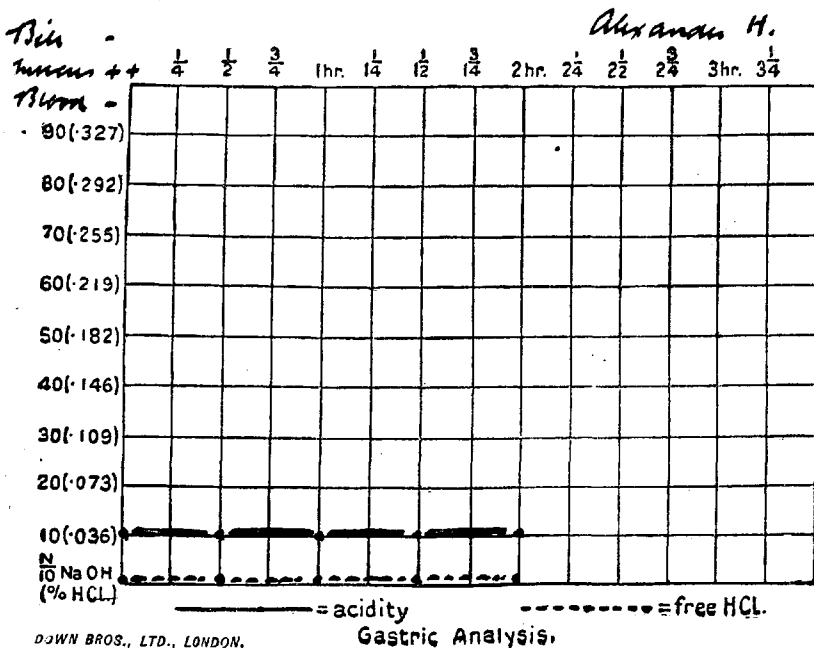
Case 1. John J. aged 14 years had bronchitis, measles and whooping cough in childhood. When first seen his mother said he was always coughing and wheezing, and was subject to attacks of dyspnoea which generally took place at the weekend. Coughing could be reflexly induced by stimulating the right nostril. Summer or Winter his condition was just the same. He was prescribed a blue pill twice weekly and a morning saline. He consulted a Dentist on account of septic teeth, and had a septal spur removed from the right nose. For ten months his condition has steadily improved. The wheezing has completely disappeared and his cough is only occasional. He has had no bronchospasm except on two occasions. The first could be attributed to a heavy supper late at night. On the second occasion I was able to ascertain that he was loafing for a week due to the fact that his friends were on holiday.



Case 2. Christina C., aged 40 years. Box girl at Subway entrance. She complained of attacks of asthma and bronchitis of many years duration. The attacks came on in early morning and wore off about 11 a.m. She had considerable free periods. An attack of asthma was usually followed by several weeks of bronchitis. Bowels were regular. She was subject to attacks of hay fever.

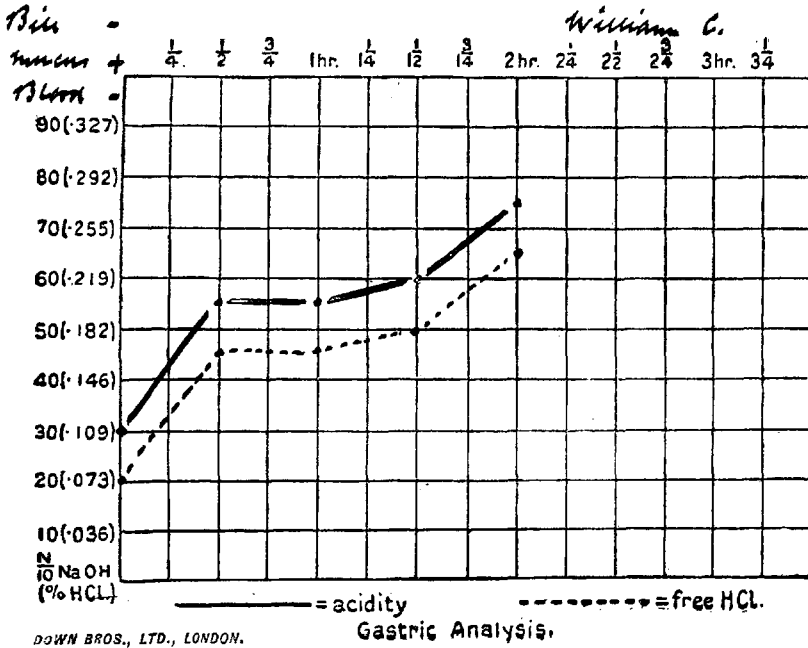


Case 3. Alexander H. aged 38 years. He had suffered attacks of asthma since two years of age. Remissions occurred while in Navy during the War. He has no gastric symptoms. Bowels move regularly except when an attack of asthma is impending.



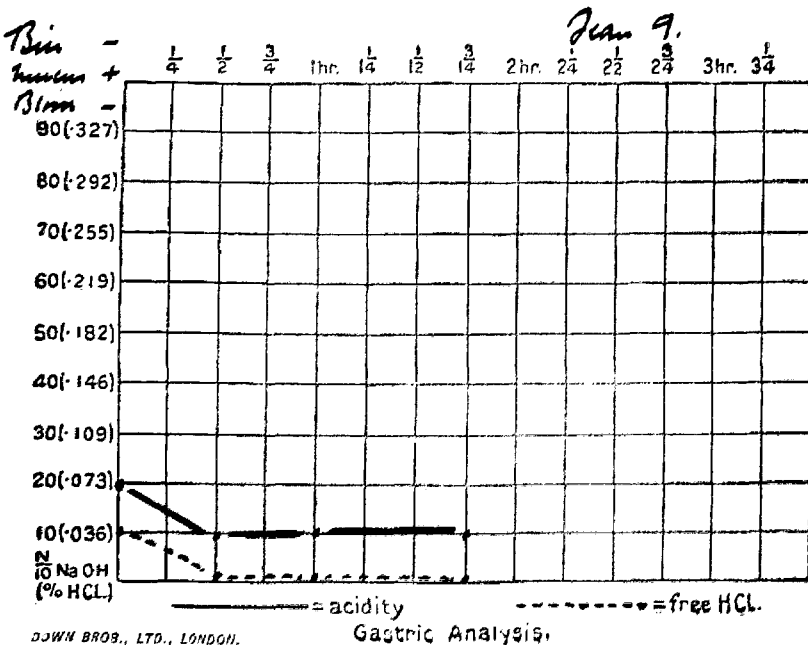
Case 4. William C. aged 48 years. Painter.

He has suffered from Bronchitis for many years. This was followed by attacks of asthma. Dr McCartney operated and removed a piece of bone from nose. He has slight discomfort after meals.



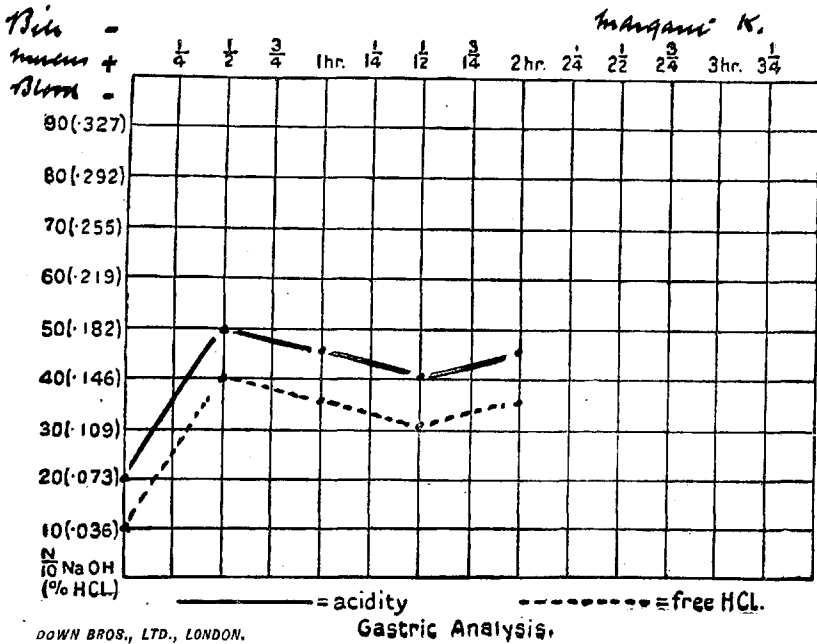
Case 5. Jean G, aged 43 years. Shop Assistant.

She was quite well until eighteen years of age when she started to have attacks of Hay Fever and Bronchitis. This was followed by attacks of asthma which had a definite week-end incidence. Her condition was such that she was forced to give up her work. She was always bad at the menstrual period.



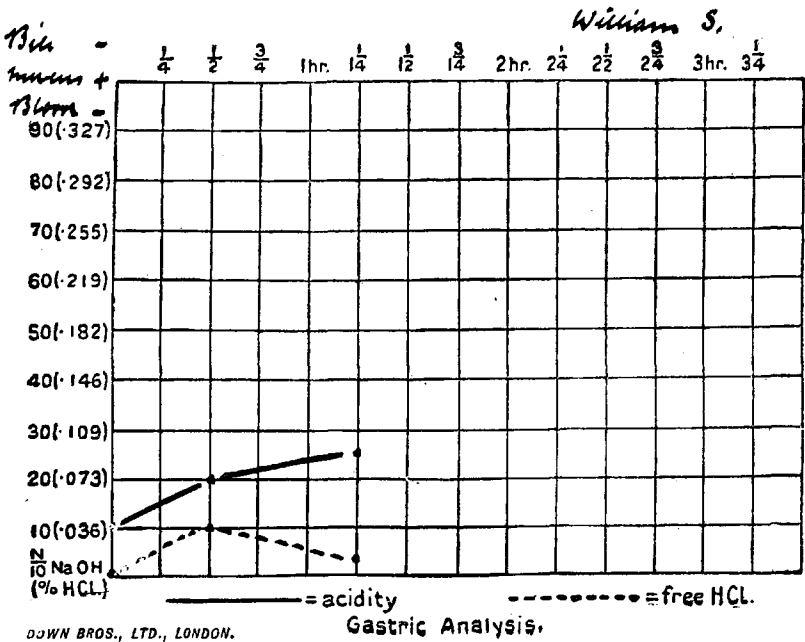
Case 6. Margaret K. aged 31 years. Shop Assistant.

The previous history was measles, congestion, scarlet fever and urticaria. She has had tonsils and adenoids removed and nose has been cauterized. Asthma began when sixteen years of age. The attack generally coincides with the beginning of the menstrual period. She has no cough unless during an attack of asthma.



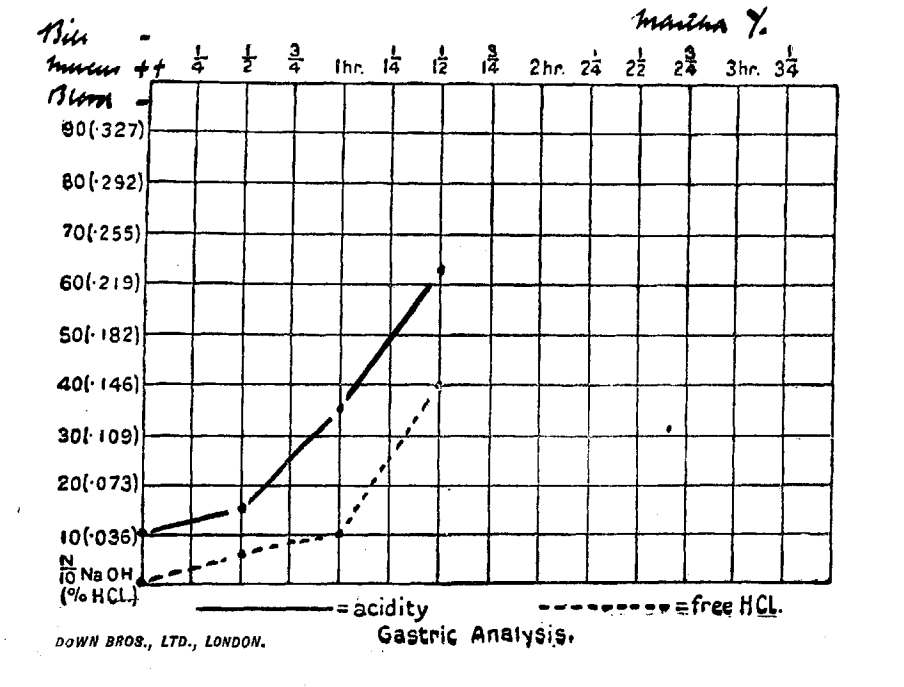
Case 7. William S. aged 32 years.

He was subject to attacks of asthma which generally took place at the week-end. He complained of discomfort after food.



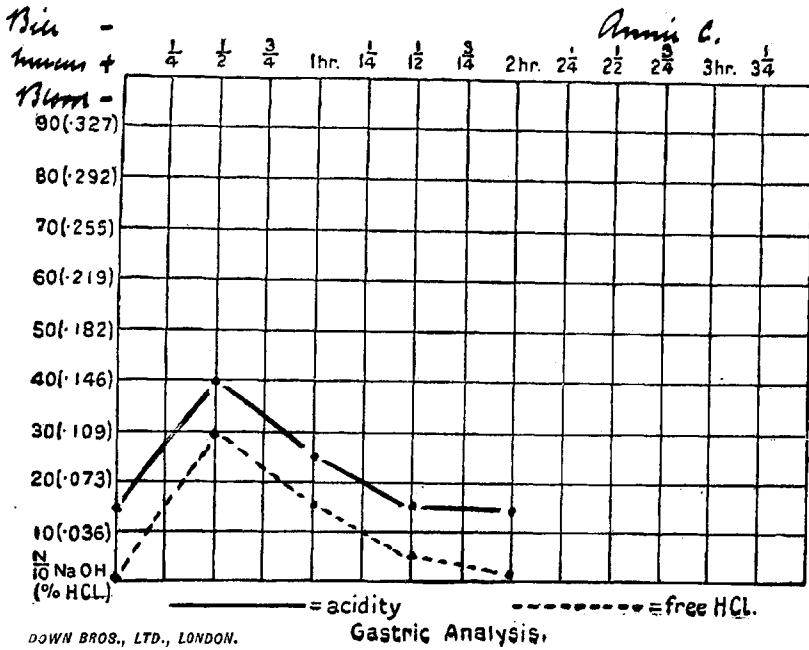
Case 8. Martha Y. aged 48 years.

The attacks of asthma came on very suddenly and very severely. She improved with treatment in hospital. On admission urine contained acetone. It was found gruel and soda bicarbonate cut short the attack. Her home conditions were not very happy. When any family quarrel took place it was followed by an attack of asthma. She was very nervous. When warned of her dismissal from hospital she said she felt she was going to have an attack of asthma. She had it that same night.



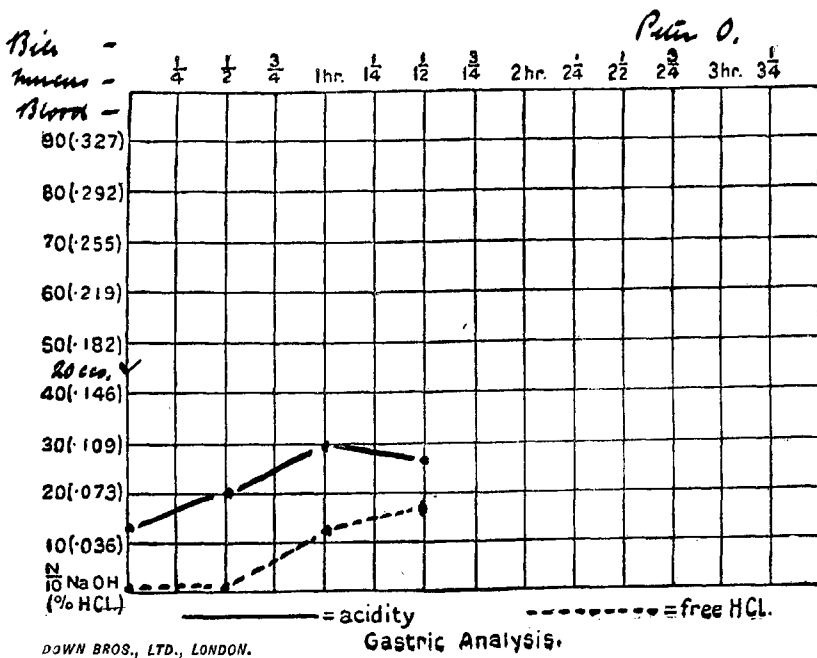
Case 9. Annie C. aged 43 years.

She has suffered from Bronchitis for many years. Attacks of asthma follow any indiscretion in diet and have a weekend tendency. She has suffered from hay fever.



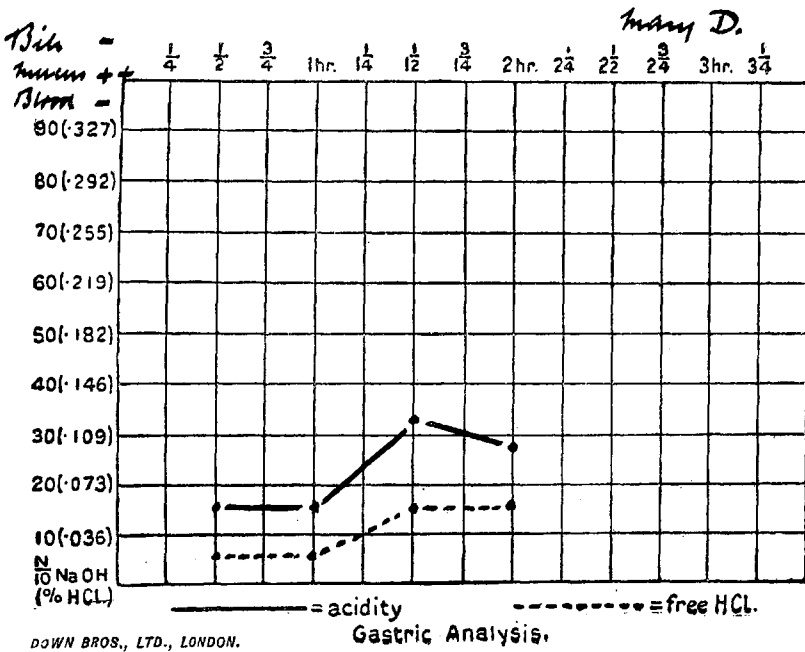
Case 10. Peter O., Aged 18. Clerk.

He had measles and whooping cough in childhood. Since five years of age he has suffered from Bronchitis. He sneezes continuously before an attack of asthma. He is also constipated before an attack. His complexion is very sallow and acneform. Calomel and Epsom salts have frequently avoided an attack of asthma.



Case 11. Mary D. Aged 57 years.

Asthma of eighteen years duration. Symptoms came on chiefly about 5 a.m. Attacks were more frequent in Summer. She is subject to Hay Fever.

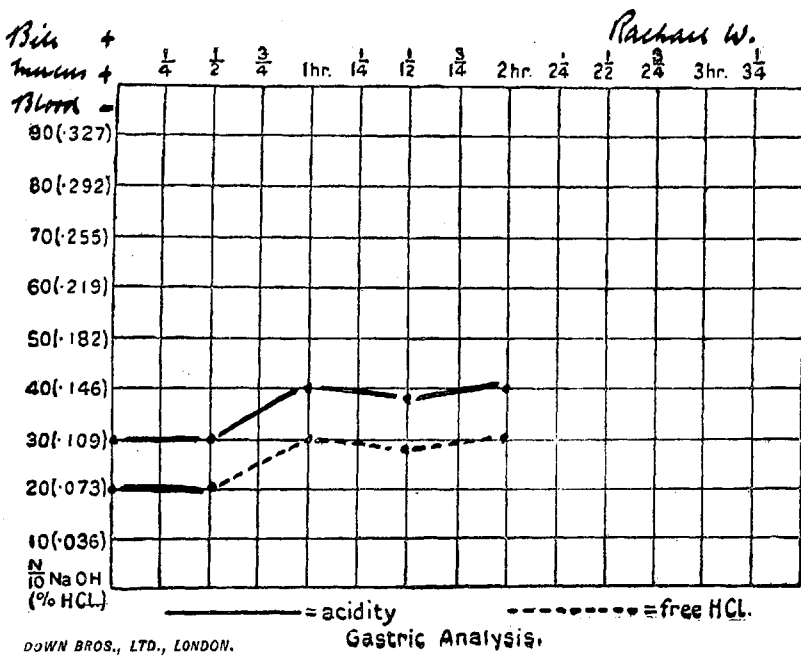


Urine analysis - Acute Attack

S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase
1028	Urates	Acid	-	Green Reduction	+	50

Case 12. Rachael W. aged 31 years.

She has always been subject to Bronchitis. Asthma began five years ago following Influenza. An attack of asthma generally occurs at the menstrual period. Her bowels are loose.

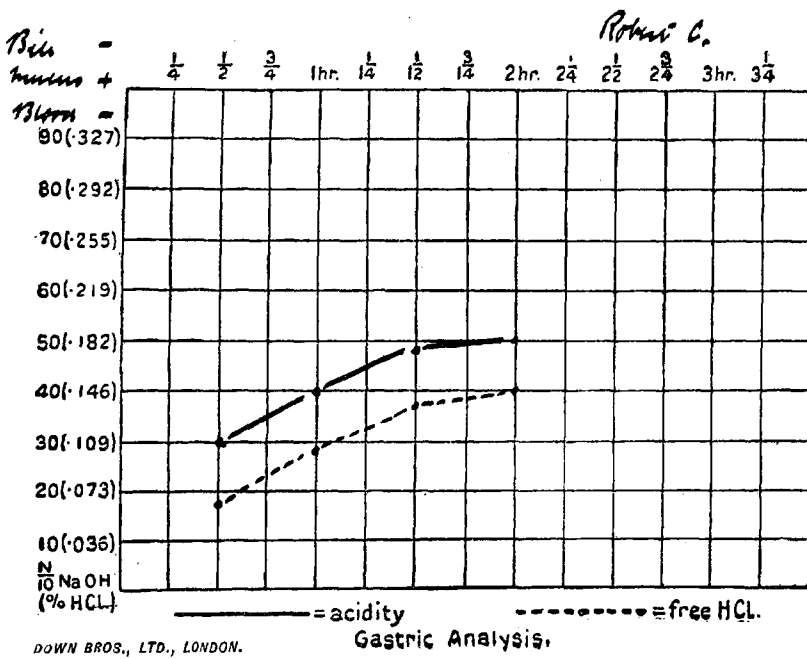


Urine analysis - Acute Attack.

S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase
1028	Urates	Acid	-	-	+	50

Case 13. Robert C. Aged 34 years.

His condition is that of Chronic Bronchitis with a tendency to weekend attacks of asthma. He is always constipated and experiences vague gastric symptoms before an attack of asthma.



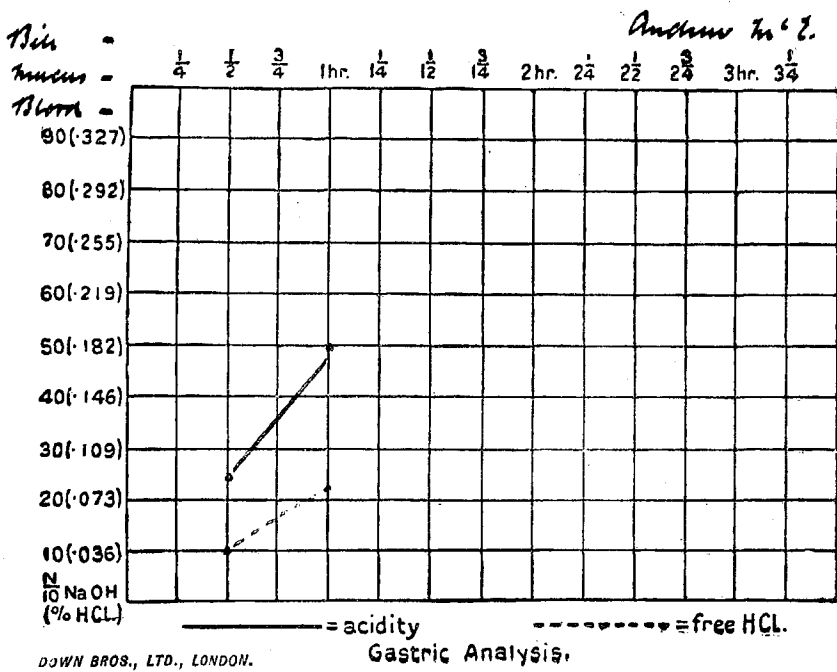
Urine analysis - Acute Attack.

S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase
1025	Urates	Acid	Trace	-	+	33

Case 14. Andrew McE. aged 56. Labourer.

At one time he worked in a Tobacco Factory and dates his Bronchitis from that time. Attacks of asthma followed. He said he was always fitter at the end of a week's work than at the beginning. He was constipated. Recently he was idle and put on weight. His condition was much worse at that time and attacks of asthma were more frequent. He now works as a labourer in a shipyard and pays attention to his bowels. He is thinner but free from attacks of asthma.

Gastric Analysis.



Urine analysis - (a) Acute Attack.

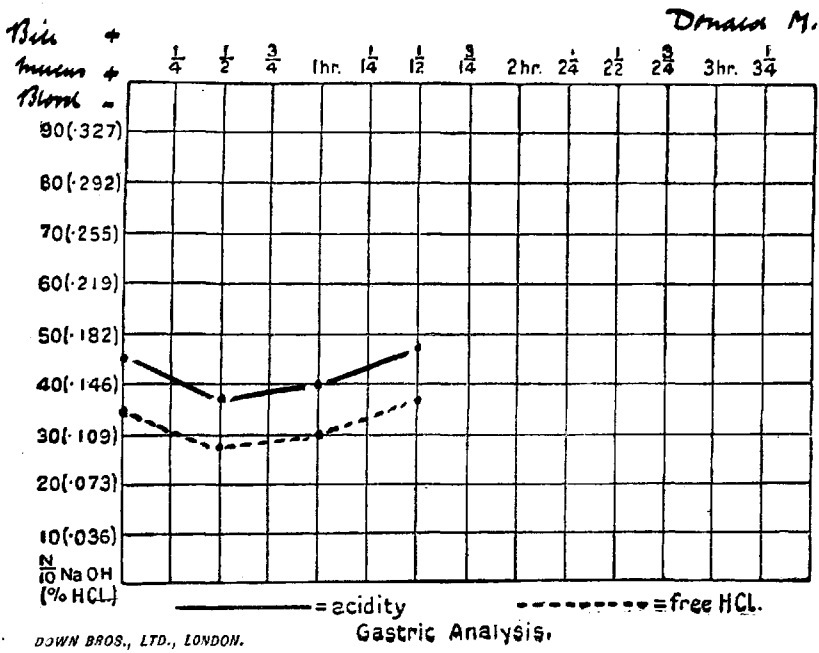
(b) After Treatment - Blue pill twice weekly and morning saline.

	S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase
(a)	1035	Urates	Acid	-	-	+	100
(b)	1027	Phos.	Acid	-	-	-	25

Case 15. Donald M. aged 35 years.

He was a prisoner of War in Germany for three years. During that time he suffered considerable privation. He was troubled with his stomach. His health has never been very good since. He had no asthma until one year ago when it followed whooping cough. Dr Adam examined nose and reported normal. He suffers discomfort in stomach and flatulence. There is no pain. The asthmatic attacks occur at intervals of a fortnight.

Gastric Analysis.



Urine analysis - (a) Acute Attack.

(b) After Treatment. Blue pill twice weekly and morning saline, The second examination was obtained one month later.

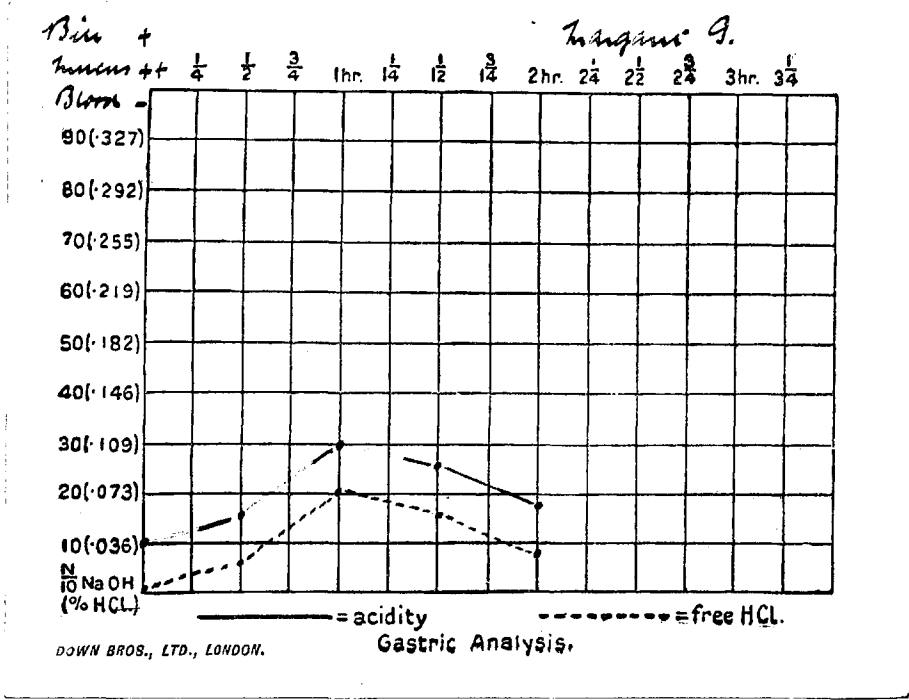
	S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase
(a)	1040	Urates	Acid	-	-	+	200
(b)							100

Case 16. Margaret G. aged 28 years. Shop Assistant.

She suffered in childhood from measles, whooping cough, congestion and diphtheria. She was at home until March 1927 when on account of depression she started work as a Shop Assistant. She was always susceptible to dust and shortly after this took definite attacks of hay fever. Her condition became gradually worse. A cold developed into a persistent cough. She was very nervous. Attacks of asthma occurred generally at the weekend, and were preceded by constipation. She was bad at the menstrual period. Finally she was forced to give up her work. The patient was first examined by me on 16th August, 1927. She was advised to take a morning saline and a blue pill twice weekly. She was also advised to take more open air exercise. As a result of this treatment she reported in February 1928 that the asthmatic attacks were not so severe and the interval between was longer. I explained to her the nature of this investigation and asked for her assistance. She consented to stop treatment and give me frequent samples of her urine. These were carefully tested and it was thus possible to get details of her condition as she passed from a free period into an attack of asthma. The treatment was recommenced and the examination continued.

Gastric/

Gastric Analysis -



Urine analysis -

- (a) Acute Attack.
- (b) After treatment. Morning saline and blue pill twice weekly.
- (c) Examinations made over a prolonged period.

	S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase	Ph.	Indican
a.1035		Urates	Acid	+	Green Reduction	+	6.6	5	+
b.1015		Phos.	Acid	haze	Green Reduction	-	20.	5.6	Faint trace

c. This is detailed later - See Group 5.

Case 17. Arthur H. aged 37 years.

He has suffered from asthma since boyhood and went to Canada about seven years ago to see if health would improve. There was no improvement. He was treated with injections for past year without much benefit. At present he is home on holiday. He has moist râles in chest between attacks of asthma. He is thin and poorly nourished and has been suspected to suffer from T.B. in America. There is no area of consolidation to be made out and sputum is negative.

Urine analysis - Acute Attack.

S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase
		neutral				50

Case 18. Margaret A.G. aged 29 years. A Nurse.

Was seen when on a visit to Glasgow. She had Bronchitis in childhood and Pneumonia when seven years of age. There was no family history of asthma. She first suffered from asthma nine years ago and would perhaps have one attack in a year. Attacks became more frequent when she would have two in a month. She had been operated on for nasal polypi. She said her health was much better when district nursing and the increase in frequency of attacks took place after she had given up district nursing to stay at home.

Urine analysis - Acute Attack.

S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase
						100

Case 19. Baby T. Aged 3 years.

He was bottle fed and a typical example of what may be termed a carbohydrate baby. He has been treated for urticaria and is subject to repeated attacks of Bronchitis and Asthma.

Urine analysis - Acute Attack.

S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase
		Acid	-	-	+	50

Case 20. Elizabeth C. aged 14 years.

She had measles, whooping cough, diphtheria and rickets. Attacks of asthma began when twelve years of age. She would have attacks every other week and always at the week-end. At attack was associated with Bronchitis. She had no cough between the attacks. At that time she was very constipated. Her bowels are now regular and she is free from asthma.

Urine analysis - Acute Attack.

S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase
	Urates		+			200

Case 21. Catherine B. aged 40 years.

She developed asthma about ten years ago. An attack is preceded by sneezing which is followed by a cough. She is very stout and has a sallow complexion.

Urine analysis - Acute Attack.

S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase
1035	Urates	Acid	-	-	+	50

Case 22. Miss R.

Urine analysis - Acute Attack.

S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase
1035	Urates	Acid	-	-	++	50

Case 23. Mary C. Aged 42 years. Cleaner.

The first attack of asthma occurred during her sixth pregnancy. This responded to alkalies. She has never been very well since. She is subject to head colds. Acute rhinitis, cough and then bronchospasm is the sequence. Attacks of asthma are usually at the week-end. She is constipated before an attack. She has a large family, is thin and poorly nourished and in addition to housework cleans offices.

Urine analysis - (a) Acute Attack.
(b) Free Interval

	S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase	Ph.	Indican
a.	1030	Urates	acid	trace	-	+	33		
b.	1026	-	acid	-	-	-	6.6	5.6	-

Case 24. John A. aged 30 years.

For first three years of life he suffered with an intractable form of eczema. This disappeared but he developed a persistent cough. An attack of asthma is preceded by constipation. There is a week-end tendency to attacks. He is very subject to colds in the head and this is generally how an attack begins.

Urine analysis - (a) Acute Attack.
(b) Free Interval.

	S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase
a.			acid			+	100
b.	1025		acid	-	-	trace	50

Case 25. Hugh McI. aged 57 years. Riveter.

He could give no history but said he always has had a bad chest. I was able to ascertain Bronchitis was followed by attacks of asthma.

Urine analysis - (a) Acute attack.
(b) Free Interval.

	S.G.	Deposit	Litmus	Albumen	Blood	Sugar	Acetone	Dias- tase	Ph.	In- dican
a.			acid	++	+	Red Reduc- tion.	trace	33		
b.	1020	No casts on micro- scopic Exam.	acid	-	-	-	Very faint trace	6.6	5.6	+

Blood urea - 24 mg per 100 c.cs. Free Interval.

Eosinophils - 9% Free Interval.

Case 26. Mr C. aged 45 years.

He had spent his life in Burma employed as an engineer. On his way home he had an attack of influenza in America. A first attack of asthma succeeded the influenza. While at home he was troubled with a cough. At the end of his leave he was examined and certified as unfit to return to Burma on account of capillary bronchitis. He then developed attacks of asthma.

Urine Analysis.

- a. Acute attack
- b. After treatment - Morning saline and blue pill twice weekly.

	S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase	Ph.	Indican
a.	1032	urates	acid	-	Green Reduction.	trace	10	5.9	trace
b.	1026	phos.	acid	-	-	-	20	6.7	-

Eosinophils. a. acute attack 18%
b. After treatment 35%

Case 27. Mrs W.

The attack of asthma began immediately before her confinement. There was no previous history of asthma. The attack was extreme in severity. The first examination of urine was obtained before any attempt was made to relieve the attack. After data were obtained she was advised to take sips of hot water and soda bicarbonate. She was given an alkaline mixture containing Ammon. Carb. The asthma was relieved immediately. In ten days she had a normal confinement. The second urine examination was made two months later when she was in the best of health. This case bears a close resemblance to Toxaemia of Pregnancy. In both cases there is a marked increase in diastase associated with a normal blood urea.

Urine analysis - a. Acute Attack.
b. After Treatment.

	S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase	Ph.
a.				-	-	+	200	5.2
b.				-	-	-	10	

Blood urea - 40 mg. per 100 ccs - acute attack.

CO₂ - 38% - acute attack.

Case 28. Robert S. Aged 9 years.

He had whooping cough, bronchitis and pneumonia in childhood. There is a weekend tendency to attacks of asthma. The attack is preceded by sneezing and a nasal discharge. When first examined he was suffering from Bronchospasm and Bronchitis. The left submaxillary glands were enlarged from septic teeth. He was constipated. The treatment was calomel powders and mist alba. When examined again on the 11th March his condition was much improved. The treatment was now a blue pill twice weekly and a morning saline. He was advised to visit a dentist. On 15th April he had no cough and was feeling much better. At this time he went to Stewarton for a holiday. I was called in to see him immediately he arrived home on the 19th. He was coughing and wheezing. I ascertained he had been staying at a hen farm and tested to find if he was sensitive to feathers. The result was negative. He was prescribed calomel powders and Epsom salts. On 7th May he was again examined. The improvement was remarkable. On 31st May he was prescribed a morning saline and a weekly blue pill, also Pulv. Rhei Co gr *iii* a.c. He reported very fit on 1st June.

Urine analysis - a. Acute attack.
 b. After treatment.
 c. Examination made over a prolonged period.

S.G.	Deposit	Litmus	Albumen	Sugar	Acetone	Diastase	Ph.	Indican
a.1026	Urates	acid	-	green reduction.	+ +	20	5.2	trace
b.1020	Phos.	acid	-	Slight green reduction.	Very faint trace	25	6.6	-

c. This is detailed later - See Group 5.

GROUPING of CASES

Certain cases being more available for examination than others the results are best described in 5 Groups.

Group 1.

Cases where a gastric analysis was obtained.

Group 2.

Cases where an examination of the urine was obtained during an attack.

Group 3.

Cases where an examination of the urine was obtained during an attack and during a free interval.

Group 4.

Cases where an examination of the urine was obtained during an attack and after eliminative treatment.

Group 5.

Cases where numerous examinations of the urine were obtained in the same patients over prolonged periods.

GROUP 1.

The following is a Summary of results in a series of 16 Cases where a gastric analysis was obtained.

Normal..... 6 cases
Hyperchlorhydria..... 2 cases
Hypochlorhydria..... 6 cases
Achyilia..... 2 cases

In 15 cases there was evidence of excessive mucus.

Name	Specific gravity	deposit	Litmus	Albumen	Blood	Sugar	Acetone	Diastase	Ph.	Indican	Eosino-phils	Blood urea	CO2
Mary D.	1028	Urates	acid	-		Green Reduction	+	50					
Rachael W.	1028	Urates	acid	-		-	+	50					
Robert C.	1025	Urates	acid	Trace		-	+	33					
Andrew McE.	1035	Urates	acid	-		-	+	100					
Donald M.	1040	Urates	acid	-		-	+	200					
Margaret G.	1035.	Urates	acid	+		Green Reduction	+	6.6	5.	+			
Arthur H.			neutral					50.					
Margaret A.G.								100.					
Baby T.			acid	-		-	+	50.					
Elizabeth C.		Urates		+				200.					
Catherine B.	1035	Urates	acid	-		-	+	50.					
Miss R.	1035	Urates	acid	-		-	+	50.					
Mary C.	1030	Urates	acid	Trace		-	+	33.					
John A.			acid				+	100.					
Hugh McI.			acid	+	+	Red Reduction	Trace	33.					
Mr C.	1032	Urates	acid	-		Green Reduction	Trace	10.	5.9	Trace	18%		
Mrs W.				-		-	+	200.	5.2			40	
Robert S.	1026	Urates	acid	-		Green Reduction	+	20.	5.2	Trace			38

GROUP 2.

In this Group most cases were seen only on one occasion. The investigation was mainly directed to the estimation of urinary diastase.

SUMMARY of DETAILS in GROUP 2.

1. The S.G. was constantly high in a series of 11 cases.
2. The deposit in each case was urates in a series of 12 cases.
3. The reaction to litmus was acid on 14 occasions in a series of 15 cases. On one occasion it was neutral.
4. Albumen was found on 5 occasions in a series of 15 cases. In one case it was present to a marked degree and was associated with blood.
5. There was a partial reduction of Fehling's solution on 5 occasions in a series of 14 cases. On 2 occasions it coincided with albuminuria. On four occasions it coincided with the 4 lowest readings of diastase. 33(3), 10, 10, 6-6
6. Acetone was constantly present in a series of 15 cases.
7. The urinary diastase was above 20 on 15 occasions in a series of 18 cases. On one occasion it was 20. On two occasions it was below 20. In six cases the results were as high as 100 units and above. Such high results have only been recorded before in such cases as Toxaemia of Pregnancy and Acute Pancreatitis.
8. The Ph. on the four occasions estimated indicated an acid reaction.
9. Indican was present when tested for.
10. The eosinophilia was 18% in the case investigated.
11. The blood/^{urea} was estimated in one case where asthma occurred in the late months of pregnancy and the urinary diastase was 200. The result showed that the kidneys were efficient.
12. The CO₂ indicated in the pregnancy case that there was a degree of acidosis.

a. Acute Attack
 b. Free Interval.

Name	Specific gravity	Deposit	Litmus	Albumen	Blood	Sugar	Acetone	Diastase	Ph.	Indican	Eosine- phils	Blood urea	CO2
John A.	(a		acid				+	100.					
	(b		acid	-		-	Trace	50.					
Hugh McI.	(a		acid	+	+	Red Reduction	Trace	33.					
	(b	No Casts on Micro scopic Exam.	acid	-	-	-	Very faint Trace	6.6	5.6	+	9%	24	
Mary C.	(a	Urates	acid	Trace		-	+	33.					
	(b		acid	-		-	-	6.6	5.6	-			

GROUP 3.

The following results represent the cases where an examination was obtained during an attack and during a free interval.

SUMMARY of DETAILS in GROUP 3.

1. Acetone was found during the attack and during the free interval in two cases. In one case it was absent during the interval when present during the attack.
2. There was a fall in diastase during the free interval in the three cases investigated.
3. In the case of Hugh McI. the presence of Albumen and Blood during the attack seemed to indicate that the kidneys were affected. During the free interval it was ascertained that the kidneys were efficient from the following data.

Albumen - neg. Blood - neg. No casts. Blood urea 24%

In the case of Mary C. Albuminuria which was evident during the attack was absent in the free interval.

a. Acute Attack
b. After eliminative Treatment.

Name	Specific gravity	Deposit	Litmus	Albumen	Blood	Sugar	Acetone	Diastase	Ph.	Indican	Eosino-phils	Blood urea	CO ₂
Andrew McE.	a. (1035	Urates	acid	-		-	+	100.					
	b. (1027	Phos.	acid	-		-	-	25.					
Donald M.	a. (1040	Urates	acid	-		-	+	200.					
	b. (100.					
Margaret G.	a. (1035	Urates	acid	+		Green Reduction	+	6.6	5.	+			
	b. (1015	Phos.	acid	haze		Green Reduction	-	20.	5.6	Faint Trace			
Mr C.	a. (1032	Urates	acid	-		Green Reduction	Trace	10.	5.9	Trace	18%		
	b. (1026	Phos.	acid	-		-	-	20.	6.7	-	35%		
Mrs W.	a. (-		-	+	200.	5.2			40	38
	b. (-		-	-	10.					
Robert S.	a. (1026	Urates	acid	-		Green Reduction	+	20.	5.2	Trace			
	b. (1020	Phos.	acid	-		Slight Green Reduction	Very faint trace	25.	6.6	-			

GROUP 4.

The following results represent the cases where an examination of the urine was obtained during an attack and after eliminative treatment.

SUMMARY of DETAILS in GROUP 4.

1. The S.G. was lowered in four cases in a series of four cases.
2. The deposit was changed from urates to phosphates on each occasion in a series of four cases.
3. The reaction to litmus was acid and was not altered in the four cases recorded.
4. There was a green reduction of Fehlings solution in three cases during the attack in a series of six cases. In one case this reduction disappeared after eliminative treatment. In another it was decreased while in the third case it was not affected. Although there was no change in the green reduction of Fehlings solution in the third case it was seen acetone completely disappeared after eliminative treatment, albumen was reduced to a haze and Indican was reduced.
5. In five cases where acetone was present during the attack it was possible by treatment to eliminate it in four cases and markedly reduce it in one case.
6. The diastase in three cases was about normal and showed small variations after treatment. The three cases where the result was high show a marked fall after treatment.
7. The three cases where an estimation of the Ph. was obtained before and after eliminative treatment show that the Ph. was raised and the urine less acid as a result of treatment.
8. Indican completely disappeared after eliminative treatment in two cases in a series of three cases. It was decreased in the third case as a result of treatment.

Date	1022	Phos.	acid	haze Faint haze	Green Reduction	Faint trace	33.3	5.2	+	6%	42	Notes
6/6/28	1015	Phos.	acid		Green Reduction	-	20.	5.6	Trace			Feeling much better. Condition much improved. Improvement maintained.
<u>ROBERT S.</u>												
5/3/28	1026	Urates	acid	-	Green Reduction	+ +	20.	5.2	Trace			Bad attack. Treatment - Calomel and mist alba. Condition much improved. Treatment - Blue pill and Morning Saline.
11/3/28	1020	Phos.	acid	-	Green Reduction	trace	10.	5.2	Trace			Improvement maintained. No cough. Home from holiday. Bad attack. Treatment - Calomel and mist alba. Much better. Treatment - Blue pill and morning saline. Feeling very well.
18/3/28	1016	Phos.	acid	-	Green Reduction	trace	6.6	6.8	Trace	11%		
25/3/28	1017	Phos.	acid	-	Green Reduction	No Reagents	20.	6.3	Trace			Improvement maintained. No cough. Home from holiday. Bad attack. Treatment - Calomel and mist alba. Much better. Treatment - Blue pill and morning saline. Feeling very well.
7/4/28	1020	Phos.	acid	-	Green Reduction	trace	20.	6.8	Trace			
15/4/28	1015	Phos.	acid	-	Green Reduction	Faint trace		6.1	Faint trace.	14%		
19/4/28	1025	Urates	acid	-	Green Reduction	+		6.1	+			Improvement maintained. No cough. Home from holiday. Bad attack. Treatment - Calomel and mist alba. Much better. Treatment - Blue pill and morning saline. Feeling very well.
20/4/28												
7/5/28	1020	Phos.	acid	-	Green Reduction	-	10.	6.6	trace			Improvement maintained. No cough. Home from holiday. Bad attack. Treatment - Calomel and mist alba. Much better. Treatment - Blue pill and morning saline. Feeling very well.
31/5/28							10.	6.6	Faint trace	10%		
1/6/28	1020	Phos.	acid	-	Green Reduction	Very faint trace	25.	6.6	-			Improvement maintained. No cough. Home from holiday. Bad attack. Treatment - Calomel and mist alba. Much better. Treatment - Blue pill and morning saline. Feeling very well.
6/6/28												
21/6/28	1018	Phos.	acid	haze	Green Reduction	Very faint trace	10.	6.3	-			Well

GROUP 5.

The following results represent the cases where numerous examinations of the urine were obtained in the same patients over prolonged periods.

SUMMARY of DETAILS in GROUP 5.

Margaret G.

1. She was constipated immediately before the attack of asthma.
2. She had premonitory symptoms before the attack commenced.
3. Evidence of an impending attack was shown by the higher S.G., the deposit of urates, the fall in Ph, and the appearance of Indican and a trace of acetone.
4. The S.G. and Ph. varied with the severity of the patients symptoms.
5. Albumen appeared coinciding with a fall in diastase and associated with a higher S.G. fall in Ph. and increased acetone.
6. Indican disappeared associated with a rise in diastase and reappeared associated with a fall.
7. The eosinophil count was lower after eliminative treatment was commenced.
8. A decrease of Indican occurred with a second rise of diastase.
9. The gradual improvement of the patient was associated with a fall of S.G. a change in the deposit and the disappearance of acetone.*

** About the same time when patient still had a trace*

Robert S.

1. He was constipated before the attack.
2. The attack was associated with a high S.G., deposit of urates and the presence of acetone, Indican and a green reduction of Fehling's solution.
3. Elimative treatment resulted in a lower S.G. deposit of phosphates, a diminution of acetone and a rise in Ph.
4. The Second attack coincided with a change of environment and mode of living.
- 5./

GROUP 5. (Contd)

5. Indican was greatly increased in the Second attack.
6. The response to eliminative treatment in the second attack was immediate and associated with the disappearance of acetone, no green reduction of Fehlings solution and a decrease of Indican.
7. The examination on 31st May showed how slight variations may occur.
8. The eosinophil count was lower as a result of eliminative treatment.
9. Indican disappeared and was associated with a rise in diastase.
10. The fall in diastase was accompanied by the appearance of a faint haze of albumen.

Indigianic B.
 Anopheles
 Swarming rainwater in
 Symptoms
 Specific Gravity

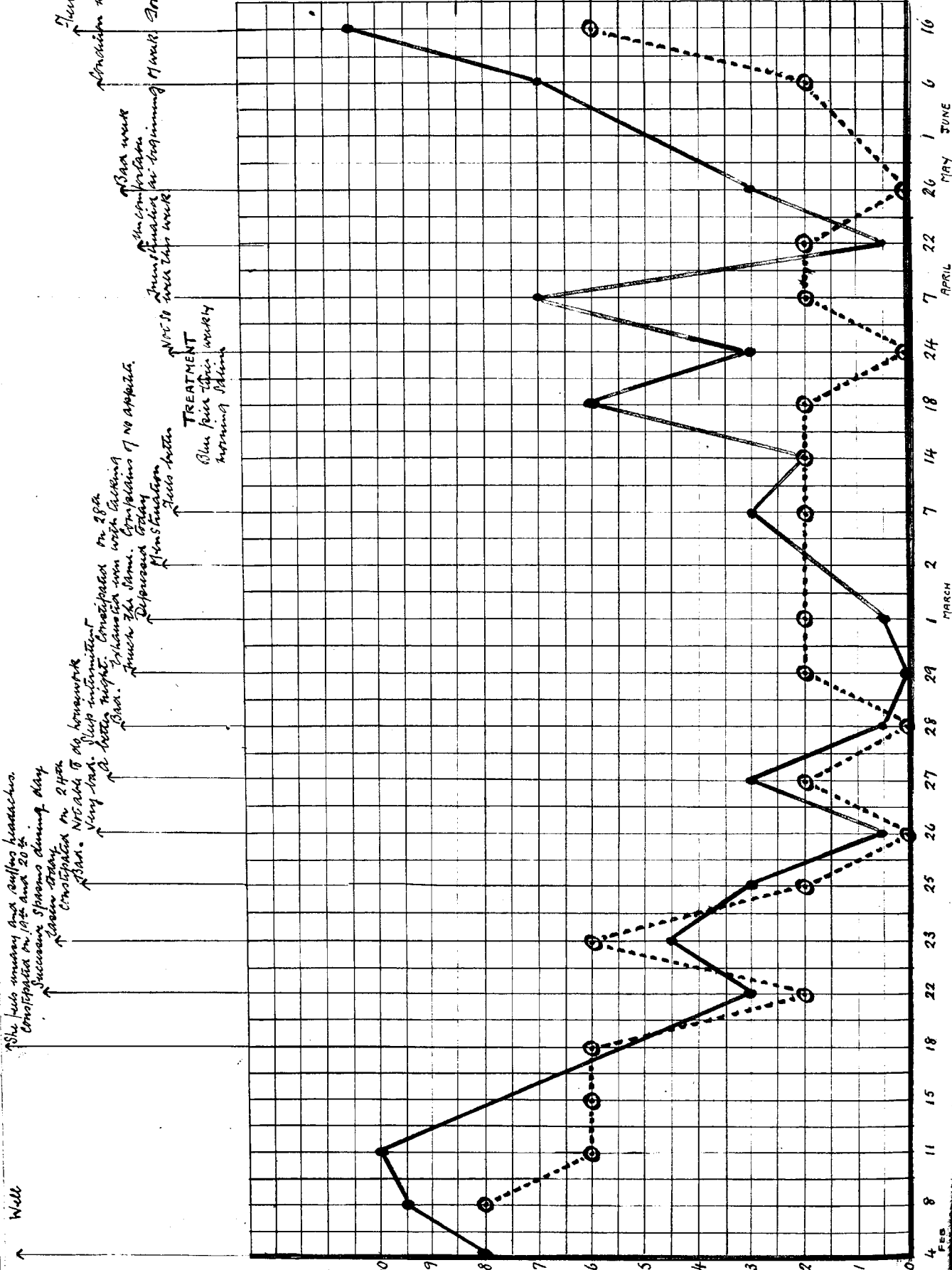
Before an attack of Bacteriemia
 During an attack of Bacteriemia
 After elimination of Bacteriemia

Well
 She has many dry ruffos leucocytes
 Computed on 14th and 20th
 Successive Spirochs during day
 Green blood
 Computed on 24th
 Very bad. No work
 No work to do tomorrow
 Sleep interrupted
 No work tonight. Computed on 28th
 Much the same. Computed on 29th
 Disposed today
 Menses today
 No work

TREATMENT
 Blue pills three weekly
 morning & evening

No work
 In the afternoon
 No work this week
 No work

No work very well.
 No work much improved
 No work



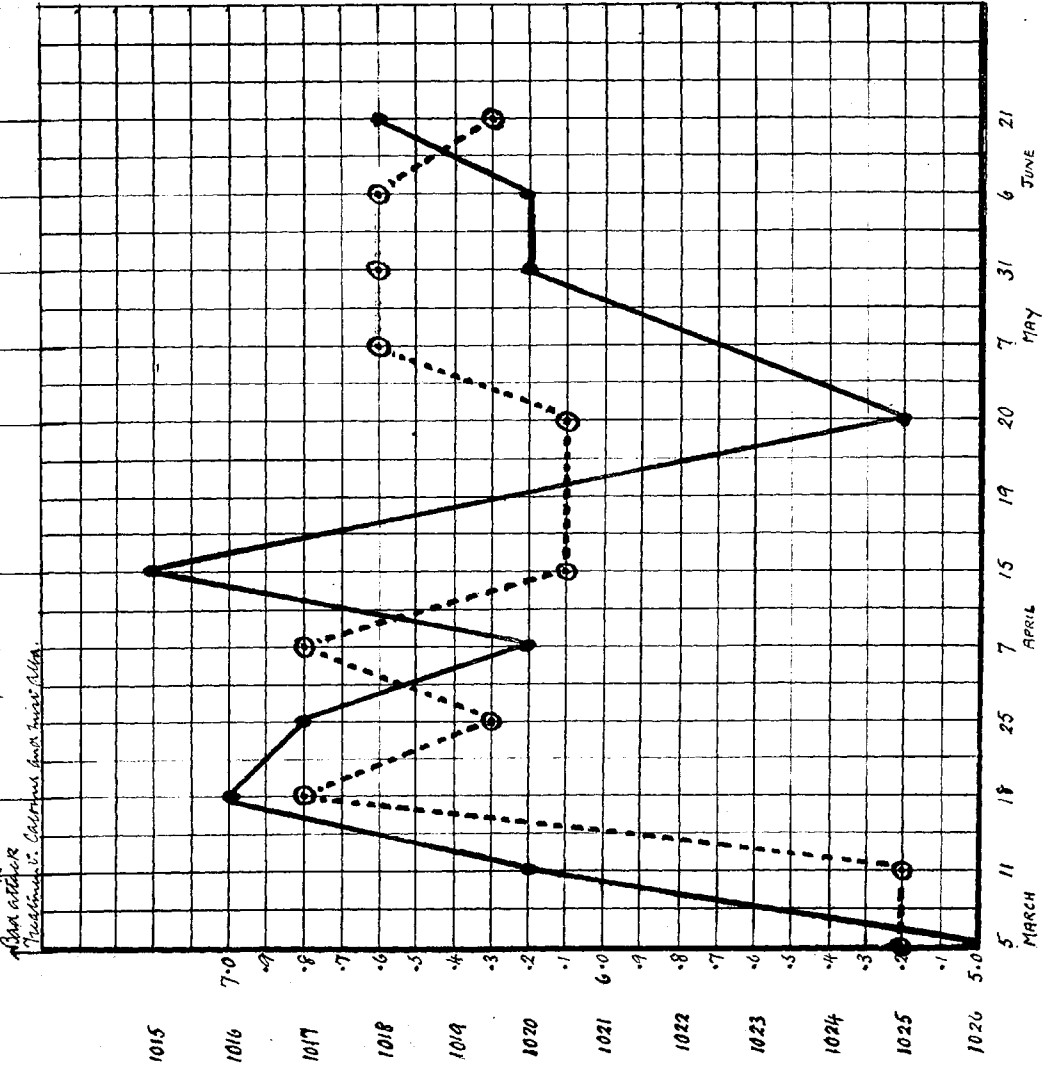
Sp. Gr. Before an attack of Bacteriemia
 Sp. Gr. During an attack of Bacteriemia

4 Feb 8 11 15 18 22 23 25 26 27 28 29 1 MARCH 1 2 7 14 18 24 7 APRIL 22 26 1 MAY 6 16 JUNE

Water
Swirling observations in
Symptoms
Specific Gravity

During an attack of Bunchgrass
After elimination treatment.

Reaction: Blue hair and turning black
Reaction: much improved
Reaction: Blue hair and turning black
Bad attack. Treatment: 1000 cc. of 1%
Ink. 1000 cc. of 1%
Blue hair and turning black
Reaction: very well.
Blue hair and turning black



pH
Specific Gravity

DATE

CONCLUSIONS

Gastric analysis gives no very conclusive results except the presence of gastric catarrh as shown by excessive mucus in all cases examined.

The examination of the urine in each group of cases shows evidence of disordered metabolism. The patient suffering from asthma seems to be in a continual toxic state because this disordered state of metabolism is present both during the attack and to a lesser extent in the free interval. The chief facts elicited pointing to this disordered state of metabolism are -

(a) There is evidence of the Specific Gravity of the urine increasing up to the onset of the attack and falling after eliminative treatment. (b) The deposit of urates in the urine during an attack changes to phosphates as the patient improves. (c) The urine is constantly acid but the degree of acidity varies, being highest during an attack. In the cases examined over prolonged periods the urine is observed to become more acid for some days previous to the onset of an attack. See Graph - Margaret G.

The examination of urinary diastase proved to be one of the most interesting parts of the investigation. Practically all the cases observed during an acute attack gave a marked increase of urinary diastase - See Group 2. Six cases gave results of 100 units and above. Such high results as far as the writer has been able to ascertain have only been previously described in such cases as Toxaemia of Pregnancy and Acute Pancreatitis. No evidence of high diastase in asthma could be found in the literature available/

available. The six lowest readings obtained during the acute period coincided with a partial reduction of Fehlings solution on four occasions and with the presence of albumen on four occasions. See Group 2. This agrees with the well known fact that a damaged kidney has difficulty in passing a colloid substance such as diastase. It is possible that an examination of the blood diastase in those cases might have shown a high blood diastase. This paper is purely a record of facts observed, but I would suggest that an increased output of diastase may be evidence of a protective response of the body against toxæmia. It is also interesting to note that both in the cases of Margaret G. and Robert S. a reduction of Indican coincided with a rise in diastase and a fall in diastase was associated with the appearance of albumen. See Group 5.

The success of eliminative treatment in reducing the toxic state of the patient is evidenced by the disappearance of acetone and Indican after the attack.

This investigation shows that there was evidence of disordered metabolism in all cases examined.

I wish to express my thanks to Drs Alex. Glen and James Adam for advice and suggestions in the preparation of this paper.

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